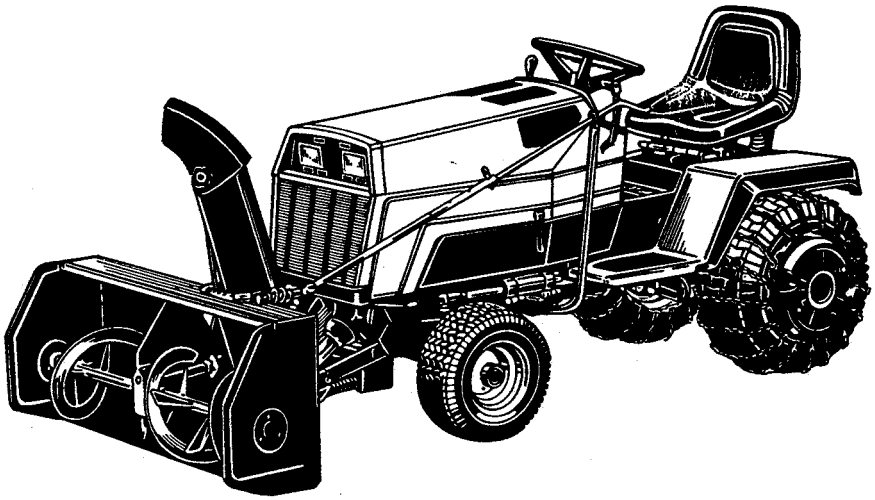
OPERATOR'S MANUAL

42" Snowthrower

Mfg. No. 1690982

For SunStar/1900 Series Garden Tractors



Simplicity®

Accessories

Tire chains and one wheel weight for each rear wheel are recommended to improve traction.

WARNING

Never operate on slopes greater than 30 percent (16.7°) which is a rise of 3 feet (0.91 meters) vertically in 10 feet (3.1 meters) horizontally. Use front and rear wheel weights for slopes greater than 15 percent (8.5°) which is a rise of 1.5 feet (0.45 meters) vertically in 10 feet (3.1 meters) horizontally. See your dealer for wheel weights. Select slow ground speed before driving onto a slope.

Read these safety rules and follow them closely. Failure to obey these rules could result in loss of control of vehicle, severe personal injury to yourself or bystanders, or damage to property or equipment. The triangle ⚠ in the text signifies important cautions or warnings which must be followed.

⚠ ALL WARNING, CAUTION and instructional messages on this attachment and on your tractor should be carefully read and obeyed. Personal bodily injury can result when these instructions are not followed.

TRAINING

- Read the operating and service instruction manual carefully. Be thoroughly familiar with the controls and the proper use of the equipment. Know how to stop the unit and disengage the controls quickly.
- Never allow children to operate the equipment. Never allow adults to operate the equipment without proper instruction.
- Keep the area of operation clear of all persons, particularly small children, and pets.

PREPARATION

- Thoroughly inspect the area where the equipment is to be used and remove all door mats, sleds, boards, wires and other foreign objects.
- Disengage all clutches and shift into neutral before starting the engine (motor).
- Do not operate the equipment without wearing adequate winter outer garments. Wear footwear that will improve footing on slippery surfaces.
- Handle fuel with care; it is highly flammable:
  a. Use an approved fuel container.
  b. Never add fuel to a running engine or hot engine.
  c. Fill fuel tank outdoors with extreme care. Never fill fuel tank indoors.
  d. Replace gasoline cap securely and wipe up spilled fuel.
- Adjust the skid shoes so that scraper bar clears gravel or crushed rock surface.
- Never attempt to make any adjustments while the engine (motor) is running (except when specifically recommended by manufacturer).
- Let engine (motor) and machine adjust to outdoor temperatures before starting to clear snow.
- Always wear safety glasses or eye shields during operation or while performing an adjustment or repair to protect eyes from foreign objects that may be thrown from the machine.

OPERATION

- Do not put hands or feet near or under rotating parts. Keep clear of the discharge opening at all times.
- Exercise extreme caution when operating on or crossing gravel drives, walks, or roads. Stay alert for hidden hazards or traffic. Do not carry passengers.
- After striking a foreign object, stop the engine (motor), remove the wire from the spark plug, thoroughly inspect the snowthrower for any damage, and repair the damage before restarting and operating the snowthrower.
- If the unit should start to vibrate abnormally, stop the engine (motor) and check immediately for the cause. Vibration is generally a warning of trouble.
- Stop the engine (motor) whenever you leave the operating position, before unclogging the collector/impeller housing or discharge guide, and when making any repairs, adjustments, or inspections.
- Take all possible precautions when leaving the machine unattended. Disengage the power take-off, lower the attachment, set the parking brake, stop the engine, and remove the key.
- When cleaning, repairing, or inspecting, make certain the collector/impeller and all moving parts have stopped. Disconnect the spark plug wire and keep the wire away from the plug to prevent accidental starting. Disconnect the cord on electric motors.

- Do not run the engine indoors, except when starting the engine and for transporting the snowthrower in or out of the building. Open the outside doors; exhaust fumes are dangerous.
- Do not clear snow across the face of slopes. Exercise extreme caution when changing direction on slopes. Do not attempt to clear steep slopes.
- Never operate the snowthrower without proper guards, plates, or other safety protective devices in place.
- Never operate the snowthrower near glass enclosures, automobiles, window wells, drop-offs, and the like without proper adjustment of the snow discharge angle. Keep children and pets away.
- Do not overload the machine capacity by attempting to clear snow at too fast a rate.
- Never operate the machine at high transport speeds on slippery surfaces. Use care when backing.
- Never direct discharge at bystanders or allow anyone in front of the unit.
- Disengage power to the collector/impeller when the snowthrower is transported or not in use.
- Use only attachments and accessories approved by the manufacturer of the snowthrower (such as wheel weights, counterweights, cabs, and the like).
- Never operate the snowthrower without good visibility or light.

MAINTENANCE & STORAGE

- Check shear bolts, engine mounting bolts, and other bolts at frequent intervals for proper tightness to be sure the equipment is in safe working condition.
- Never store the machine with fuel in the fuel tank inside a building where ignition sources are present such as hot water and space heaters, clothes dryers, and the like. Allow the engine to cool before storing in any enclosure.
- Alway refer to operator's guide instructions for important details if the snowthrower is to be stored for an extended period.
- Maintain or replace safety and instruction labels, as necessary.
- Run the machine a few minutes after throwing snow to prevent freeze-up of the collector/impeller.

Assembly

1. A washer is provided which must be added to the hydraulic valve. The purpose of the washer is to reduce travel time when snowthrower is raised or lowered. This washer has an outside diameter of 1/2 inch, and has a hole in the middle slightly smaller than 1/16 inch.
   a. Remove the upper left-hand panel from the tractor to expose the valve (A, figure 1).
   b. Notice there are two elbows on left side of valve. Disconnect the hose (B) from the front elbow (C). Remove the elbow (C).
   c. Place the washer fully in the hole so it stands vertically.
   d. Reinstall the elbow (C) and then connect the hose (B). Tighten the nut on the elbow securely, after elbow is properly positioned.

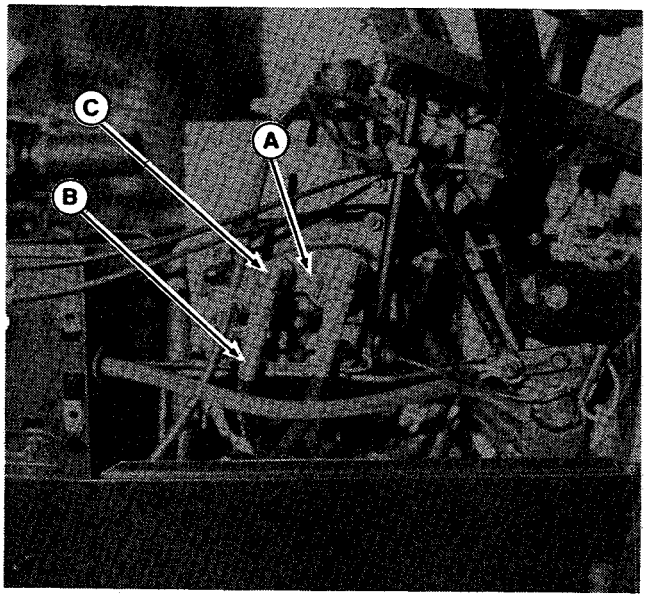


Figure 1. ← Front

A. Valve
B. Hose
C. Elbow

2. When the snowthrower is shipped, a shipping plug is installed in the top of the gear box, visible through hole in top of housing. A vent plug is supplied in the plastic bag. Remove and discard the shipping plug. Install the vent plug in hole in top of gear box.
3. Connect the hitch (A, figure 2) to the body with four 7/16-14 x 1 capscrews and flange nuts (B) and two 3/8-16 x 1 capscrews and flange nuts (C).
4. The rear half of the drive shaft (D, figure 2) is shipped loose. Insert this half into the front half. (Drive shaft is also shown in figure 4.)

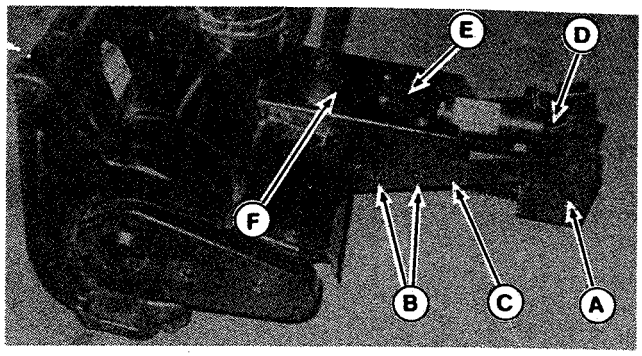


Figure 2.

A. Hitch
B. Capscrew, 7/16
C. Capscrew, 3/8
D. Drive Shaft
E. Shield
F. Gear Box Plug

5. Install the chute.
   a. Place the chute on the opening so the clip on the housing is positioned in the notch on the chute. Then, rotate extension slightly to start rim under clip. Oil mating surfaces so it rotates smoothly.
   b. Wrap the cable around the chute and attach with hardware shown in figure 3. Also, see figure 6 for an illustration of how cable is wrapped around spool.

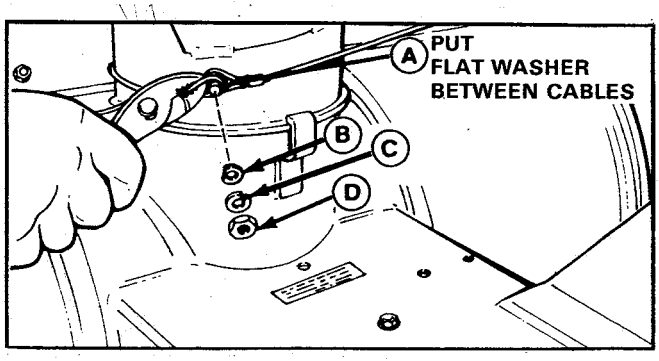


Figure 3.

A. Flat Washer
B. Cup Washer
C. Lockwasher
D. Nut

6. To install skid shoes, place two 3/8-16 x 3/4 carriage bolts (A, figure 3A) through housing as shown. Install skid shoes (B) and secure with flat washers (C), lockwashers (D) and locknuts (E).

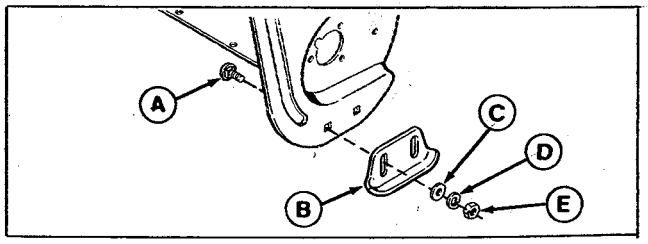


Figure 3A.

A. Carriage Bolts
B. Skid Shoes
C. Flat Washers
D. Lockwashers
E. Locknuts

Installation

1. For winter operation, loosen the air cleaner cover wing nut (A, figure 3B) pull intake hose (B) out of plenum hole (C) and rotate cover slightly.

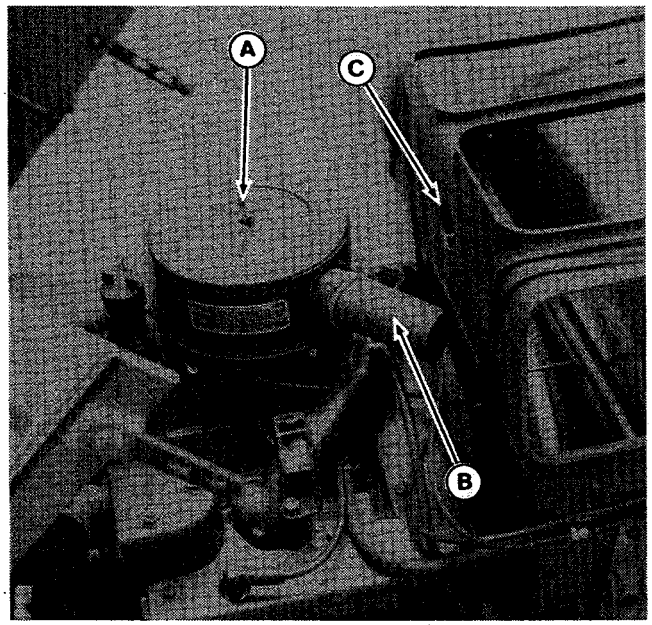


Figure 3B
A. Wing Nut
B. Intake Hose
C. Plenum Hole

2. Position the snowthrower in front of the tractor. Lift up snowthrower hitch and place onto hooks (A, figure 4).
3. The pins (B, figure 4) are attached to straps that pivot inside the snowthrower hitch. Raise the straps and insert the pins (B) through holes on each side. Install the hairpin clips (C).
4. Connect the drive shaft (D) as follows:
   a. Grasp the locking ring (G) and pull toward snowthrower. While holding ring, slide the coupler fully onto drive shaft. It may be necessary to rotate until splines align.
   b. Grasp the U-joint (E) and pull toward snowthrower until the locking ring (G) snaps into locked position in drive shaft groove. To test, pull on U-joint. You will not be able to pull off shaft, if properly installed.
5. Remove the rear engine base plate bolt (B, figure 5). Install the spout rotator support bracket (A, figure 5) with new 3/8-16 x 1-1/4 carriage bolt, washer and nut (B). Insert the handle (C) through the eyebolt (D).
6. Attach the spout rotator handle (A, figure 6) with the pin and cotter pin (B).

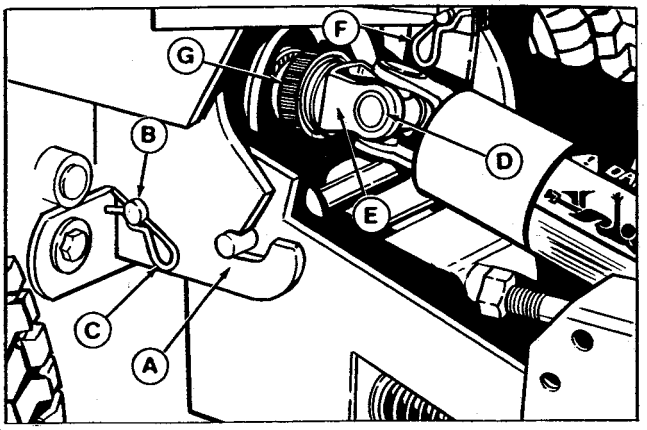


Figure 4.
A. Hooks
B. Pin
C. Hairpin Clip
D. Drive Shaft
E. U-Joint
F. Spring Clip
G. Locking Ring

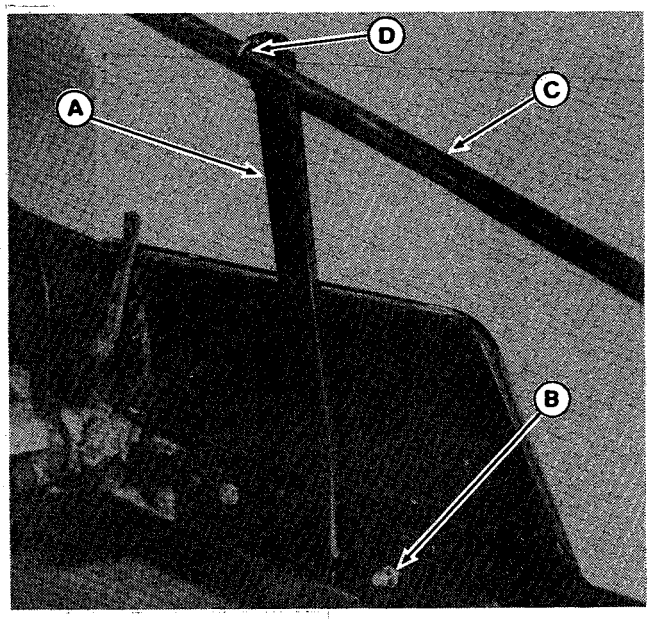


Figure 5.
A. Bracket
B. Bolt, Washer, and Nut
C. Handle
D. Eye Bolt

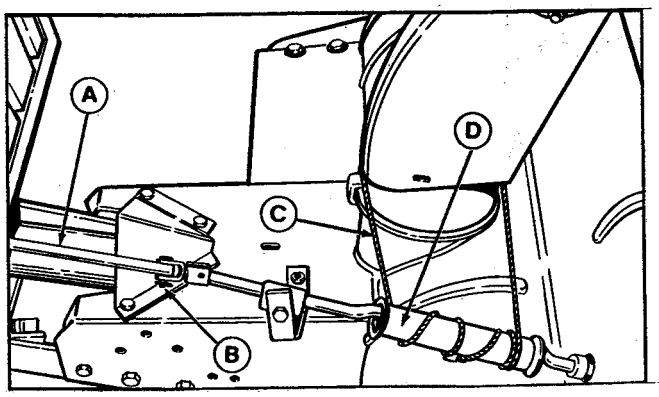


Figure 6
A. Spout Rotator Handle
B. Pin and Cotter Pin
C. Cable
D. Spool

7. Refer to figure 7. This shows the correct position of the lift rod (A, figure 7) when installed. The raised surface (B) is positioned to prevent pin from being installed from right-hand side (interference would occur).

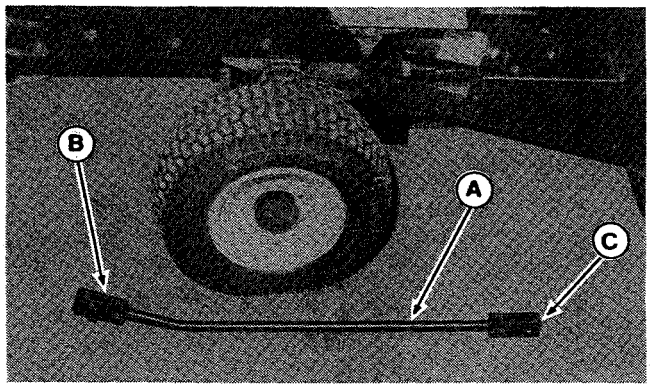


Figure 7.
A. Lift Rod
B. Raised Surface
C. Clevis

8. The lift rod must be inserted from rear of the front axle, aligning clevis (C, figure 7) with lift bar (A, figure 8). Connect clevis with pin and spring clip (F, figure 4). Install so that head of pin is toward PTO belts, to avoid interference.

9. Connect the rear of the lift rod to the tractor lift lever (A, figure 9) with pin and hairpin clip (B). It may be necessary to move the hydraulic lift lever up or down to align lift rod. Sit in seat and start engine to raise or lower hydraulic lift lever. Stop engine before working on tractor.

10. Increase front tire pressure to 20 psi for use with snowthrower. This complete the installation.

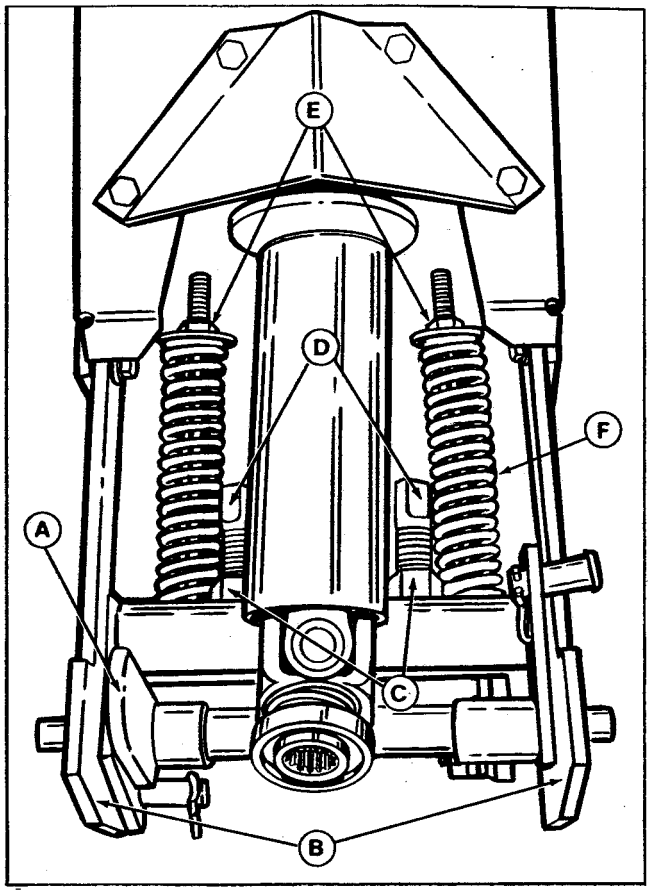


Figure 8.
A. Lift Bar
B. Hitch
C. Nuts
D. Bolts
E. Nuts
F. Springs

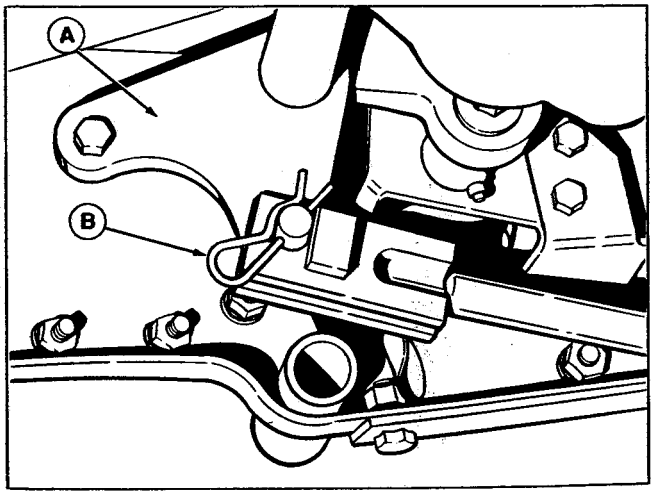


Figure 9 (Under Tractor)
A. Tractor Lift Lever
B. Hairpin Clip

Removal

1. Remove the lift rod completely from tractor by disconnecting from lift lever (A, figure 9) and from the hitch lift bar (A, figure 8).

CAUTION

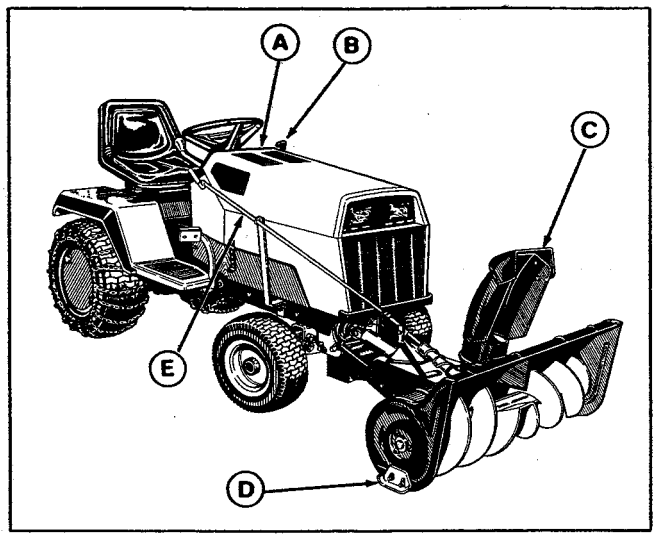
When removing snowthrower from tractor for season, always remove the lift rod.

2. Remove the spout rotator bracket (A, figure 5) from the tractor.
3. Disconnect the driveshaft by pulling locking ring (G) toward front, then slipping driveshaft off.
4. Remove the hairpin clips (C, figure 4) and pins (B). The hitch can now be removed from tractor.
5. Reduce front tire pressure to 12-15 psi for normal operation.

Operation

CONTROLS

Refer to figure 1 for explanation of controls.



Item	Name	Operation
A	PTO Switch	(Located on dash.)Pull up and push forward to engage snowthrower auger. Pull back to stop snowthrower.
B.	Lift Lever	Pull back to raise snowthrower. Push forward to lower snowthrower for operation.
C.	Deflector	Loosen knob to adjust deflect to control angle of snow discharge.
D.	Skid Shoes	Adjust to control scraper bar height (see Skid Shoe Adjustment).
E.	Spout Rotator	Rotate to control direction of discharge.

Figure 1.

CHECKS BEFORE STARTING

1. Check the tires for proper inflation pressure: 20 psi (138 kPa) is recommended for front tires when snowthrower is installed.
2. Refer to Normal Care section of this manual to determine and perform needed care. Also refer to the tractor manual Normal Care section to be sure it is prepared for winter use.
3. Clear the area of operation of all articles which might be caught in or thrown by the snowthrower.
4. Adjust the chute deflector by loosening the wing nut and moving the deflector up or down. Be sure to tighten the wing nut after positioning the deflector. Most snowthrowing can be done with the deflector all the way up and the engine at 3/4 to full speed.
5. Clear the auger of any ice particles which may damage the auger.
6. Adjust the skid shoes as outlined in the Adjustment section of this manual to suit the type of surface you will be operating on.
7. Make sure all screws, nuts and pins are present and secure.

TRANSPORTING

Disengage the PTO and then raise the snowthrower. Adjust ground speed according to road conditions.

ENGINE SPEED & GEAR SELECTION.

Set the tractor engine throttle to 3/4 to full speed for normal snow throwing. Full engine speed is best when throwing wet and heavy snow. Use the slower engine speeds to adjust the throwing distance during operation and when throwing light snow.

The tractor ground speed will depend upon the type and amount of snow that must be cleared. For wet or deep snow, use slower tractor ground speed and faster engine speed.

SNOW REMOVAL SUGGESTIONS

⚠ CAUTION

Always raise the snowthrower before turning or backing to prevent damage to it.

Determine the best snow removal pattern before beginning. Wind direction is an important factor to consider. Rotate the spout to discharge snow downwind. Plan the pattern so that you avoid throwing snow on cleared areas and on yourself as you're operating.

When land contour permits, it is best to travel in the longest direction to minimize turning.

⚠ WARNING

If the auger stalls or the chute plugs, disengage the PTO, stop the engine and remove the key. Set the parking brake. WAIT FOR MOVING PARTS TO STOP. Remove the foreign object or clear the spout before restarting engine.

In very deep or heavy snow, it may be necessary to make the first pass with snowthrower partially raised, backing up every few feet to clear the snow left on the surface. Also, it may be necessary to slice off less than the full width of the auger or to reduce ground speed. If the snow stops flowing freely from the spout, use reverse to back away until snowthrower clears itself.

Normal Care

SCHEDULE FOR NORMAL CARE

A schedule for normal, routine care is given in the following chart.

Care Required	Schedule
Clean snow and ice from snowthrower.	After each use.
Lubricate snowthrower (see Lubrication).	Every ten hours or at least once a year.
Inspect, adjust and lubricate drive chain.	Once a year or more often under frequent use.
Check gear box oil.	Once a year.

Normal Care Chart

⚠ WARNING

For your personal safety, disengage PTO, stop engine, remove key, set parking brake, and be sure snowthrower auger has stopped turning before attempting to maintain, service or adjust the snowthrower.

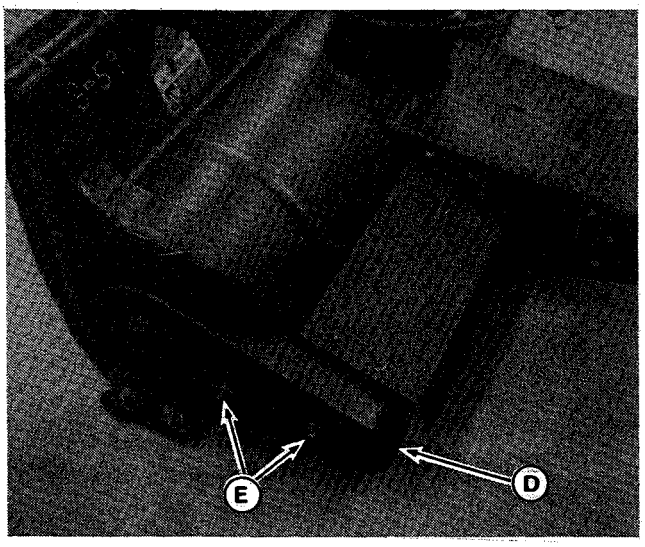


Figure 11A.

A. Screws
B. Nuts
C. Studs
D. Chain Guard
E. Nuts
F. Drive Shaft Sprocket
G. Chain
H. Auger Sprocket
I. Drive Shaft Housing

LUBRICATION

With a grease gun, apply 2 or 3 shots of lithium base automotive grease to five grease fittings, as follows:

a. One fitting is located at shaft next to chain housing (figure 11B).

b. Two grease fittings are located on drive shaft; one at each knuckle.

c. Two grease fittings are located on auger; one at each end (inside housing).

INSPECT, LUBRICATE & ADJUST DRIVE CHAIN

1. Remove the chain guard (D, figure 11A) by removing the two nuts (E).
2. Check the chain for wear or damage. Replace chain if worn or broken.
3. There should be no slack in the chain and the sprockets (F & H, figure 11B) should be aligned. The drive shaft (I) should be parallel with the auger housing. To adjust, proceed as follows:

   a. Loosen the two screws (A) and two nuts (B).

   b. Pull rearward on the drive shaft (I) until all slack is removed from chain. With drive shaft parallel to auger housing and sprockets aligned, retighten the two screws (A) and nuts (B). Be sure to hold nuts while tightening screws (A) and hold screws (inside housing) while tightening nuts (B). Torque to 40-45 ft. lbs.

   c. Spread a coat of grease on the chain, working the grease into the links.

   d. Reinstall the chain guard and two nuts. Be sure to re-install the spacers on the studs (C) before installing guard (D).

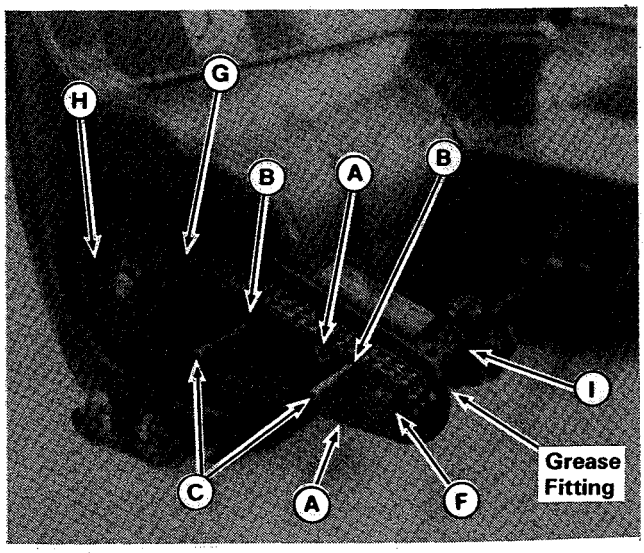


Figure 11B.

CHECK GEAR BOX OIL

Remove snowthrower from tractor and place it on a level surface.

The oil level is checked by removing the plug which is visible through hole in top of housing (F, figure 2). However, to check level, the snowthrower must be tipped forward so that it rests on auger opening. The gear box must be level. Place wood block as necessary under edge of auger housing so that top and bottom surfaces of gear box are parallel with the ground.

To check oil level, remove the plug. The oil level should be at bottom of hole. If not, add SAE 80W90 gear oil. Reinstall the plug.

NORMAL STORAGE

Between snow removal jobs, the tractor and snowthrower are best stored in a cool, dry area. If the unit is stored in a warm (above freezing temperature) area, it should be moved outdoors and allowed to cool before beginning work. Otherwise, the snow may melt on the warm surfaces of the snowthrower and then freeze where it can cause jams.

Before returning the unit to storage, stop the tractor and remove key from ignition. Then brush off all snow from both the snowthrower and the tractor. If possible, restart the tractor engine and allow it to idle for about 5 minutes. This will help melt and dry up snow in hidden areas of the engine. These efforts will help avoid freezeups that might otherwise hinder easy starting and operation the next time the unit is needed.

OFF-SEASON STORAGE

To protect your snowthrower, store it in an enclosed dry area. Prepare the snowthrower for off-season stoage as follows:

1. Remove snowthrower from tractor.
2. Hose or brush the main housing to remove all dirt and chipped paint.
3. Paint or lightly coat with oil any area where paint has worn or chipped away.
4. Lubricate snowthrower. (See Lubrication.)
5. Store the snowthrower in a dry place. Store the belt in as cool, dark place away from heat and sunlight.
6. To save space, the hitch can be removed for storage by removing the two pins and spring clips attaching it to the snowthrower, and by removing the belt from the snowthower auger pulley.
7. Apply a light coat of grease to spline area of drive shaft.
8. If tractor is to be used in warm weather, rotate the air cleaner cover (figure 3B) back to original position, with rubber tube (B) inserted in plenum (D).

Troubleshooting

⚠WARNING

To avoid serious injury, perform maintenance on the tractor or snowthrower only when the engine is stopped. Always remove the ignition key before beginning maintenance to prevent accidental starting of the engine.

Troubleshooting procedures are provided below. To use these procedures, first locate the problem description that best describes the trouble that you have encountered. Check the possible causes one at a time in the order that they are listed. Correct any problems that are found and try to operate the snowthrower again to see if you have eliminated the trouble.

Problem	Cause/Remedy
1. Snowthrower auger does not rotate.	**A.** PTO switch not engaged. Engage PTO switch. See Operation section. **B** Foreign material blocking auger. STOP engine. Remove key. Unplug auger. **C.** Drive chain broken. Replace parts as necessary. **D.** Front PTO clutch faulty. See your dealer.
2. Auger rotates, but snow not thrown far enough.	**A.** Engine RPM too slow. Operate engine at 3/4 - full throttle. **B.** Ground speed too fast. Use slower speed. **C.** Snowthrower discharge spout clogged. STOP engine. Remove key. Unplug discharge spout.
3. Scraper bar does not clean down to hard surface.	**A.** Skid shoes not properly adjusted. Adjust skid shoes. See Adjustment Section. **B.** Not enough down pressure. See Adjustment Section.
4. Snowthrower picks up and throws stones on gravel drive.	**A.** Skid shoes not properly adjusted for gravel surface. Adjust skid shoes. See Adjustments Section. **B.** Too much down pressure on snowthrower. Use the tractor lift lever to raise the snowthrower slightly. See Operation section. **C.** Too much down pressure. See Adjustment Section.
5. Tractor does not have sufficient traction.	**A.** Tractor too light at rear wheels. Use rear wheel weights and tire chains. See Accessories.
6. Tractor not stable on sloping surfaces.	**A.** Ground speed too fast. Reduce ground speed. **B.** Tractor not properly weighted. Use rear wheel weights and tire chains. See Accessories. **C.** Tire pressure incorrect. Inflate tires according to tractor operator's manual.

Adjustments

WARNING

Always stop the engine before inspecting or making adjustments.

TRANSPORT HEIGHT ADJUSTMENT

1. Check the Height Adjustment as follows.
2. Start the tractor engine. Using the tractor lift lever, raise the snowthrower to highest position. There should be slight clearance between back of hitch (B, figure 8) and tractor stops. To check, raise up on snowthrower by hand. You should be able to raise up snowthrower one or two inches before upward movement is stopped by tractor. To adjust, go to step 3.
3. Loosen the two nuts (C, figure 8). Turn the two bolts (D) in or out an equal amount until adjustment is correct. Turning bolts in will raise the snowthrower. Then, tighten the two nuts (C).

SKID SHOE ADJUSTMENT

The skid shoes can be adjusted up or down to keep the snowthrower working efficiently on various types of surfaces.

On smooth, hard surfaces, such as concrete or asphalt, the skid shoes should be adjusted so that the scraper bar is resting on the surface.

To adjust the skid shoes up or down, loosen the two nuts holding each skid shoe and move the skid shoes to the desired position (see figure 12). Tighten the nuts securely, making sure the skid shoes are parallel to the ground surface and both adjusted to the same level.

On rough surfaces, such as gravel, the skid shoes should be adjusted down. This helps to keep the scraper bar above the ground so that it doesn't pick up stones. Use scraps of wood to raise the scraper bar about 1 inch (25 mm) above the level ground surface. Then drop the skid shoes down to the ground, keeping the bottom edge of the skid shoes level. The snowthrower will not be supported by the skid shoes.

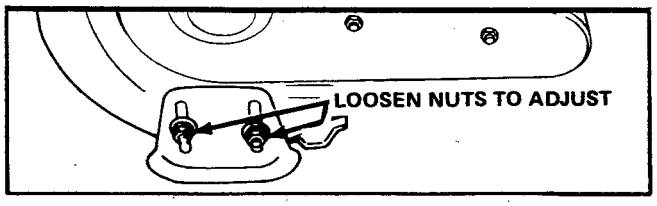


Figure 12. Skid Shoe Adjustment

DOWN PRESSURE ADJUSTMENT

To increase the down pressure of the snowthrower on the surface, turn two nuts (E, figure 8) to compress the springs (F). To allow the snowthrower to float over the surface, back off the nuts, reducing spring compression. Always leave at least two full threads at end of rods.

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